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Laravel Api Masterclass: Autentikasi, Role-Based Access and Crud Testing

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ABSTRACT

The latest developments in web technology require mastery in the development of well-planned and secure APIs as a foundation for integrating various digital systems. However, many new developers have difficulty in understanding the basic principles and practices of creating web-based APIs. To fulfil this need, the service team organised an event entitled "Laravel API Masterclass: Authentication, Role-based Access, and CRUD Testing" which aims to introduce the basics of API development using the Laravel framework to participants with various backgrounds. This activity was organised in the form of Webinars and Workshops, which included the delivery of theoretical material on API concepts, Laravel project structure, and role-based authentication and access control, followed by hands-on practical sessions from setting up to testing APIs using Postman. Through this programme, participants are expected to build a strong foundation for creating APIs that meet industry standards and are ready to be applied in small to medium-sized web application development.

Perkembangan teknologi web yang terbaru memerlukan penguasaan dalam pengembangan API yang terencana dan aman sebagai landasan untuk mengintegrasikan berbagai sistem digital. Namun, banyak pengembang baru yang mengalami kesulitan dalam memahami prinsip dasar serta praktik pembuatan API berbasis web. Untuk memenuhi kebutuhan tersebut, tim pengabdi mengadakan sebuah acara bertajuk "Laravel API Masterclass: Autentikasi, Akses Berdasarkan Peran, dan Pengujian CRUD" yang bertujuan untuk mengenalkan dasar-dasar pengembangan API dengan menggunakan framework Laravel kepada peserta dengan berbagai latar belakang. Kegiatan ini diselenggarakan dalam bentuk *Webinar* dan *Workshop*, yang mencakup penyampaian materi teori tentang konsep API, struktur proyek Laravel, serta cara autentikasi dan kontrol akses yang berbasis peran, diikuti dengan sesi praktik langsung dari pengaturan hingga pengujian API menggunakan Postman. Melalui program ini, diharapkan peserta dapat membangun fondasi yang kuat untuk menciptakan API yang memenuhi standar industri dan siap

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diterapkan dalam pengembangan aplikasi web dengan skala kecil hingga menengah.

A. INTRODUCTION

The public's need for fast and easily accessible information is growing, making mastery of information technology, especially in web-based API development, crucial. This means that digital systems need to be able to connect and communicate directly through robust backend infrastructure, one example of which is creating web-based Application Programming Interfaces (APIs). (Rashid & Abdulmaged Ismael, 2024). APIs play an important role in integrating various digital services today, enabling mobile applications, internal systems, and third-party services to communicate and exchange data in an efficient and secure manner. Laravel has emerged as one of the most widely used PHP frameworks for creating secure, efficient, and maintainable RESTful APIs thanks to its ORM features, routing structure, and MVC architecture. (Ariyanto et al., 2024). Although Laravel has built-in security features—such as CSRF tokens, fillables that prevent mass assignment, and rate limiting—threats can still arise if these features are not utilised or are used incorrectly. (Beniwal et al., 2024).

In a recent study by (Putra et al., 2025), also demonstrates trends and best practices in creating APIs with Laravel, including RESTful standards, API version documentation, and the implementation of Laravel Sanctum or Passport for token-based authentication and role-based access control. And in another study conducted by (Aravinda A Kumar & Divya Tl, 2024), emphasising that RESTful API protection is a crucial element, such as implementing JWT-based tokens, maintaining token storage security, encrypting passwords using bcrypt, and implementing strict input validation methods to avoid security risks such as SQL injection and token misuse (JSON Web Token, OAuth2). To ensure security is well maintained, developers are advised to implement access rights management using a modular approach and ensure that the API endpoint structure is consistent and well documented. OWASP and various other studies also emphasise the importance of implementing rate limiting policies, HTTPS encryption, and strict CORS settings to ensure that APIs remain secure from bot attacks, malicious scripts, or other illegal access. (Bagas et al., 2024).

Therefore, the community service team organised this webinar and workshop as a form of community service in the field of web-based back-end development, specifically in creating APIs with Laravel. Skills in creating secure and organised APIs are now crucial, given the increasing number of modern applications that require direct data integration between systems. (Vovveti, 2024). In addition, understanding concepts such as authentication, role-based access control, and CRUD testing is essential as a foundation for creating reliable and secure digital services. In this event, participants will not only be introduced to the basic concepts of Laravel, but will also receive direct guidance in the practice of API creation, from project setup and database configuration to endpoint testing using Postman.

According to Prehanto et al. (2021), Webinars are a means of conveying information and communication in online training. Seminars that were once conducted in person have now shifted to an online format. Webinars have become a creative alternative in the education process that takes place in the virtual world, allowing both speakers and participants to interact visually and in writing during the session. Another study in the International Journal of Training and Development by (Gegenfurtner et al., 2020), states that webinars are a digital means of providing simultaneous training in audio and visual form to participants who are far away, and the results show that webinars can deepen understanding of the material and increase flexibility and accessibility in the learning process. Meanwhile, according to Mochamad Muslih dan Serina Oktavia Marbun (2020), Workshop is an activity involving individuals with expertise in a particular field to discuss specific issues and provide training to participants by involving resource persons in the delivery of theory and hands-on practice in a field of science.

Through these webinars and workshops, participants are not only introduced to the basic principles of API development with Laravel, but also participate in in-depth practical sessions during the workshops. This provides them with the opportunity to directly apply the knowledge they have learned, from building a Laravel project structure, setting up role-based authentication and access control, to testing API endpoints with Postman. Therefore, it is hoped that this journal can reflect the efforts, commitment, and results achieved by participants in understanding the foundations of secure, structured, and industry-standard API development using Laravel.

B. METHODS

To realise the activities outlined above, the community service team took steps to implement them. These activities were carried out in two stages, namely community education in the form of webinars and training in the form of workshops. To hold the webinars and workshops, the community service team carried out several stages.

1. Stage 1 (Activity Socialisation)
   At this stage, the community service team conducted socialisation on social media by sharing flyers and registration links at the URL https://forms.gle/Q2ngSLiN9B3jMWUg9 regarding the Webinar and Workshop activities. The flyers were posted on social media broadcast messages in WhatsApp groups.
2. Stage 2 (Activity Material Preparation)
   In this stage, the volunteer team prepared activity materials for the Webinar and Workshop to be held. The materials were presented in the form of learning modules and PPTs and were presented by the speakers during the activities.
3. Stage 3 (Pre-Test Completion by Participants)
   On Sunday, 13 July 2025, the event will commence with committee preparations from 11:00 to 12:00 WIB. The committee will then gather and distribute the Zoom link and virtual background (VG) link, as well as distribute the pre-test questions to all participants. This is to ensure that all participants can join smoothly when the event begins and also use the VG provided by the committee for the success of the event. Before the activity begins, participants are asked to complete a pre-test at the URL https://forms.gle/DX2RA3zFs3x1ioG66, which contains material about the webinar and workshop. The pre-test is designed to assess participants' level of understanding of the material that will be presented. The results will later be compared with the post-test given after the activity.
4. Stage 4 (Community Education through Webinar)

In this webinar, the community service team introduced basic material on API development using Laravel, with a focus on authentication, role-based access management, and CRUD testing. The material began with an explanation of the basic concepts of authentication, the implementation of role-based access control, and the use of Postman and PHPUnit for API testing.

5. Stage 5 (Training through Workshops)
   The workshop was conducted online via the Zoom Meeting Conference platform, with presenters from the Computer Science Department at Muhammadiyah University Jakarta who have specialised in this field through internships and independent study. Participants directly practised creating a simple Laravel API, starting from authentication coding with Laravel, implementing role-based access management, to testing CRUD using Laravel Eloquent and Postman. This activity aims to provide practical skills in building secure, efficient, and thoroughly testable APIs, using tools such as Laravel, Composer, Postman, and PHPUnit, which have been installed beforehand.
6. Stage 6 (Attendance, Feedback, and Post-Test by participants)
   At the end of the activity, participants are asked to provide feedback to assess their satisfaction with the material presented by the instructors. Participants are also requested to complete the Attendance and Feedback forms accessible via the URL https://forms.gle/h6zjuH1b2PcWRz6TA, as well as the Post -Test can be accessed at the URL https://forms.gle/L54U8ubzXshakHJu9. The results of the Post-Test will be compared with the Pre-Test to assess participants' level of understanding of the material presented.
7. Stage 7 (Preparation of Community Service Reports and Publication of Webinar & Workshop Results)
   After holding the webinar and workshop, the community service team compiled an activity report that included a summary of the implementation, pre-test and post-test results, and feedback from participants. This webinar successfully improved participants' understanding of Android application development, as evidenced by the increase in their post-test scores. Activity documentation and digital certificates were published on the University of Muhammadiyah Jakarta's computer science programme website, accessible via the URL https://informatika.umj.ac.id/Detail-Berita-Prodi/593/Webinar-& -Workshop---Laravel-API-Masterclass:-Membangun-Autentikasi,-Akses-Berbasis-Peran,-dan-Pengujian-CRUD.html and WhatsApp group. In addition, the community service team was responsible for publishing the results of the webinar and workshop in the form of a community service journal article, with the aim of providing information and reports to the general public and participants. Publication is carried out by compiling comprehensive documentation articles, including summaries of activity implementation, pre-test and post-test results, and feedback from participants. This article was then uploaded to the community service journal platform. In addition, documentation of activities, such as photos, zoom recordings, learning modules and PPTs, were shared via Instagram and WhatsApp groups. To show appreciation to participants, digital certificates were sent via both platforms. Data analysis from pre-tests and post-tests was also published to show the impact of the activities that had been carried out. The community service team took advantage of this opportunity to promote upcoming activities through teasers or digital flyers.

C. RESULTS AND DISCUSSION

This webinar and workshop was organised by students from the Information Technology study programme at the Faculty of Engineering, Muhammadiyah University

Jakarta. The event was held online via Zoom Meeting Conference at https://s.umj.ac.id/FTUMJ-02 on Sunday, 13 July 2025, from 13:10 to 15:30 WIB. A total of 35 participants attended the event, representing various institutions, with the majority being students from the Computer Science programme at the University of Muhammadiyah Jakarta. The event was conducted online via Zoom Meeting Conference and included interactive sessions such as Q&A throughout the event. Below is the schedule for the Webinar and Workshop:

Table 1. Schedule of Events.

Time	Activity	PIC
13.10 – 13.15	Opening	Fikry Muhammad
13.15 – 13.20	Recitation of the Qur'an	Irfan Pandu
13.20 – 13.25	Singing of the Indonesian National Anthem and Muhammadiyah Anthem	Fauzan Azima
13.25 – 13.27	Reading of the CV of Webinar 1 Speaker	Fikry Muhammad
13.27 – 13.55	Webinar Material	Yova Rezky
13.55 – 13.57	Reading of Workshop Speaker CVs	Fikry Muhammad
13.57 – 15.10	Workshop Material	Muhammad Zikri
15.10 – 15.20	Question and Answer Session	Fikry Muhammad
15.20 – 15.25	Group Photo	Fauzan Azima
15.25 – 15.30	Closing	Fikry Muhammad

Then the service stage was carried out as described above.

1.1 Stage 1 (Activity Socialisation)

At this stage, the team conducted socialisation to the general public through the Instagram social media accounts @informatika_ftumj and @hmif_ftumj in order to attract interested participants by distributing flyers as shown in the following image:

Figure 1. Activity Flyer

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1.2 Stage 2 (Activity Material Preparation)

In this stage, the presenter prepares the material to be delivered in PPT format. The material is organised in such a way that it is easy for participants to understand. The webinar material begins with an introduction to Laravel, authentication, JWT and CRUD, as well as the tools used. This is followed by workshop material on implementation based on the webinar presentation. The activity material can be seen in the following image.

Figure 2. Webinar Activity Material

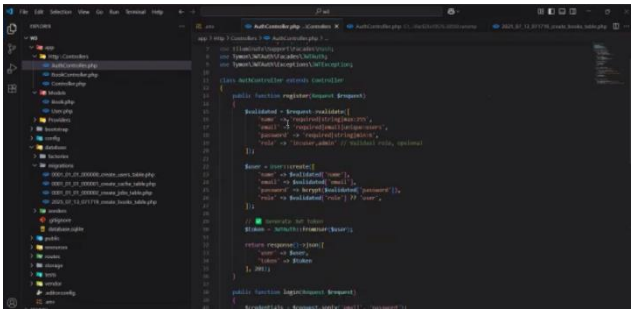

Figure 3. Webinar Activity Material

1.3 Stage 3 (Pre-Test Completion by Participants)

At this stage, participants were asked to complete a pre-test provided by the service team. This pre-test consisted of questions related to the webinar and workshop title, namely 'Laravel API Masterclass: Authentication, Role-Based Access, and CRUD Testing.' The purpose of the Pre-Test is to assess participants' level of understanding prior to the facilitator team conducting this activity. The results show that 46 out of 75 participants registered for this activity completed the Pre-Test, with a comprehension rate of 76.74%, indicating a satisfactory level.

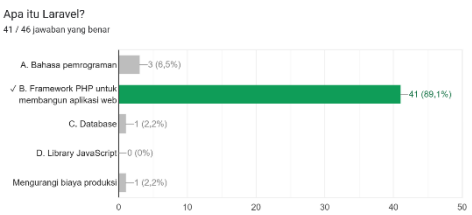

Figure 4. Pre-test Question Number 1

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The image above shows that 46 participants took the pre-test, with a correct answer percentage of 89.1% for question number 1.

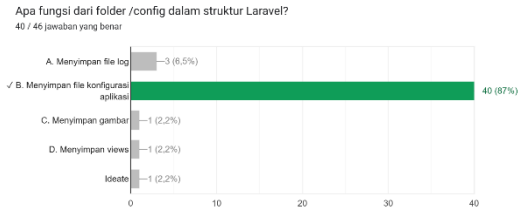

Figure 5. Pre-Test Question Number 2

The image above shows that 46 participants took the pre-test, with 87% of participants answering question number 2 correctly.

1.4 Stage 4 (Public Education Through Webinars)

In this stage, the webinar presenter, Yova Rezky Apriliano, presented the material that had been prepared in stage 3 above to the participants, namely the general public. The material presented was entitled 'LARAVEL API MASTERCLASS: AUTHENTICATION, ROLE-BASED ACCESS AND CRUD TESTING'. The webinar material began with an introduction to Laravel as well as authentication, role-based access, and CRUD. At this stage, there was also an interactive session with participants, such as questions asked by the presenter and participants via the Zoom meeting conference chat. As a result, participants gained a deep understanding of Laravel as well as authentication, role-based access, and CRUD.

Figure 6. Presentation of Webinar Material

In the image above, the presenter explains the Laravel folder structure. This introduction aims to help participants understand how Laravel organises its files and folders, so that participants can more easily develop APIs with authentication, role-based access, and CRUD testing features. This explanation is presented in theoretical form as part of the Laravel API Masterclass webinar.

1.5 Stage 5 (Training Through Workshop)

In this stage, the workshop presenter, Muhammad Zikri, provided a direct implementation of the webinar material that had been presented previously. In this workshop implementation, the presenter used the Visual Studio Code IDE tool, which was run on the Windows operating system. Participants had been asked to install Laravel and its supporting tools before the activity began. The presenter explained the basics of creating an API with Laravel, then outlined the Laravel folder structure and the steps for building authentication features, role-based access, and CRUD testing. As a result, the presenter guided participants

step by step through the creation of a simple API with Laravel, from project setup and database configuration to endpoint implementation and testing using Postman.

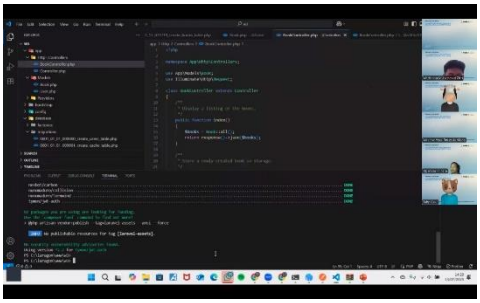

Figure 7. Presentation of Workshop Material

In the image above, the presenter can be seen explaining the steps that need to be taken in the workshop process.

1.6 Stage 6 (Participants Complete Post-Test)

In this stage, participants are asked to fill in their attendance and complete a post-test distributed via Google Form. The post-test consists of questions similar to those in the pre-test, the results of which can be used to compare participants' understanding before and after attending this webinar and workshop. The following are the results of the post-test completed by participants.

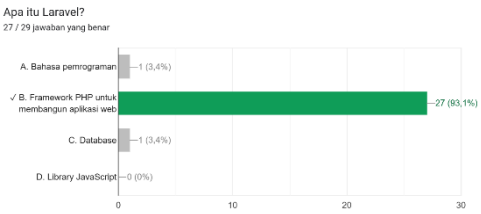

Figure 8. Post-Test Question Number 1

The image above shows the post-test results for question number 1, with 27 participants answering correctly, representing 93.1% of the total.

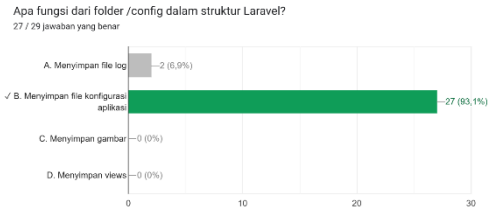

Figure 9. Post-Test Question Number 2

The image above shows the post-test results for question number 2, with 27 participants answering correctly, representing 93.1% of the total.

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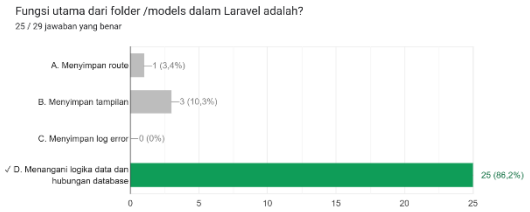

Figure 10. Post-Test Question Number 3

The image above shows the post-test results for question number 3, with 25 participants answering correctly, representing 86.2% of the total.

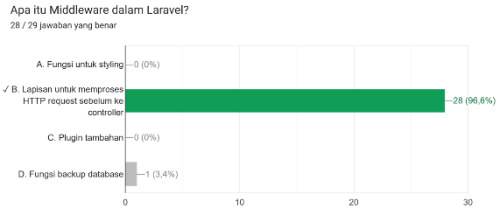

Figure 11. Post-Test Question Number 4

The image above shows the post-test results for question number 4, with 28 participants answering correctly, representing 96.6% of the total.

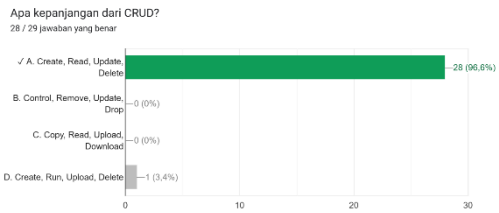

Figure 12. Post-Test Question Number 5

The image above shows the post-test results for question number 5, with 28 participants answering correctly, representing 96.6% of the total.

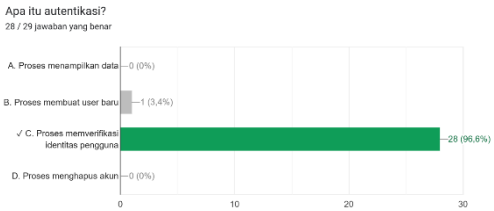

Figure 13. Post-Test Question Number 6

The image above shows the post-test results for question number 6, with 28 participants answering correctly, representing 96.6% of the total.

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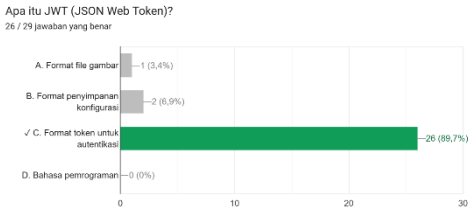

Figure 14. Post-Test Question Number 7

The image above shows the post-test results for question number 7, with 26 participants answering correctly, representing 89.7% of the total.

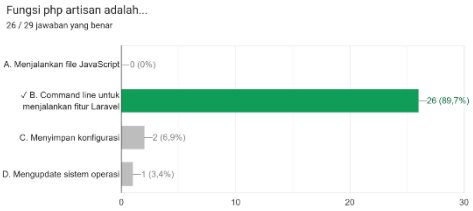

Figure 15. Post-Test Question Number 8

The image above shows the post-test results for question number 8, with 26 participants answering correctly, representing 89.7% of the total.

Figure 16. Post-Test Question Number 9

The image above shows the post-test results for question number 9, with 25 participants answering correctly, representing 86.2% of the total.

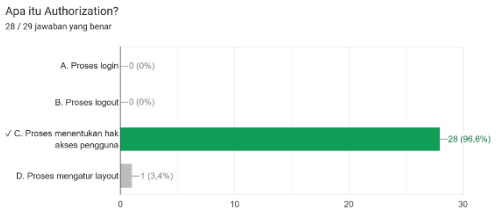

Figure 17. Post-Test Question Number 10

The image above shows the post-test results for question number 10, with 96.6% of the 28 participants answering correctly.

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After all activities have been completed, participants who have attended the webinar and workshop will receive a certificate signed by the Head of the Information Technology Study Programme at Muhammadiyah University Jakarta.

1.7 Stage 7 (Compare Pre-Test and Post-Test)

After participants completed all webinar and workshop sessions on API creation using Laravel, an assessment was conducted to determine the extent of participants' understanding of the material presented. This assessment was carried out in two stages, namely a pre-test given before the activity began and a post-test given after all sessions ended. The questionnaire used contained ten questions about the basic concepts and application of Laravel, covering folder structure, middleware, authentication, and the use of API endpoints.

The results of both tests were analysed to evaluate the effectiveness of the learning process. The image below shows a comparison of the percentage of correct answers between the pre-test and post-test for all participants:

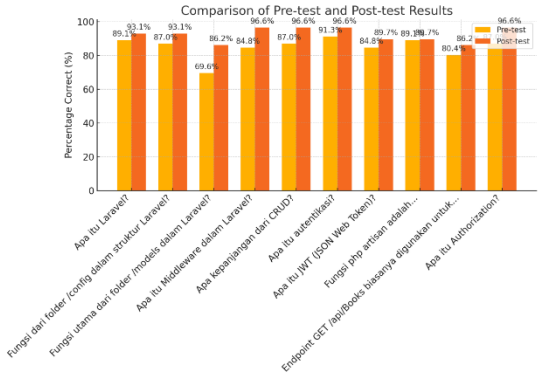

Figure 18. Comparison of Pre-Test and Post-Test Results

From the graph shown, there was a significant increase in participants' understanding in almost all aspects. For example, for the question 'What is Middleware in Laravel?', there was an increase from 69.6% to 86.2% in the post-test. In addition, several aspects showed a high level of mastery both before and after training, such as questions about 'What is Laravel?' and 'What is JWT (JSON Web Token?)', both of which were above 90%. This data shows that the training programme was successful in improving participants' ability to understand the basic concepts of API development using Laravel.

D. CONCLUSION

Based on the implementation of the Webinar and Workshop 'Laravel API Masterclass: Authentication, Role-Based Access and CRUD Testing' held on 13 July 2025 via Zoom Meeting Conference at 13:00–15:30 WIB, it can be concluded that this event was successful and achieved its objectives. The event was attended by 35 participants from various institutions, including students from Muhammadiyah University Jakarta, National University, and the general public, who showed great enthusiasm in learning API development using Laravel. The material was delivered in two sessions, the first through a theoretical presentation by Yova Rezky Apriliano and the second through hands-on practice by Muhammad Zikri, covering the basics of Laravel, authentication, role-based access, and CRUD testing. Pre-test results indicated that participants' initial understanding averaged 76.74%, which then increased significantly in the post-test to over 90%, signifying the programme's success in

enhancing participants' skills. It is hoped that similar events will continue to be held to support the development of practical skills in the web application development sector.

E. ACKNOWLEDGEMENTS

The author and team would like to express our gratitude to the Alumni and the Information Technology Study Programme at the Faculty of Engineering, Muhammadiyah University Jakarta, for their support and assistance in organising the webinar and workshop entitled 'Laravel API Masterclass: Authentication, Role-Based Access and CRUD Testing'. We also appreciate the committee and organisers who collaborated to plan and execute this event successfully. We would also like to extend our heartfelt thanks to all participants who took part and provided valuable feedback throughout the event.

F. AUTHOR CONTRIBUTIONS

In the webinar and workshop entitled 'Laravel API Masterclass: Authentication, Role-Based Access and CRUD Testing,' each team member had clear contributions and responsibilities to ensure the smooth running of the event and the preparation of scientific articles. Yova Rezky Apriliano was the chief executive responsible for the overall running of the event and supervising the tasks of the team members, as well as acting as the webinar presenter. Fauzan Azima was in charge of compiling the journal and creating promotional content, including flyers, and acted as the operator during the event. Fikry Muhammad Zahran contributed to the creation of pre-test and post-test forms to measure participants' learning outcomes and acted as the moderator who hosted the event during the webinar and workshop sessions. Muhammad Zikri was tasked with being the workshop presenter, which was an implementation of the webinar material, and also contributed to the preparation of the KKN report and learning modules. Rita Dewi Risanty acted as the supervising lecturer who provided direction, supervision, and support so that the webinar and workshop ran smoothly until the scientific articles were checked. All the community service team worked together to ensure the success of this activity and the quality of the articles produced.

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